

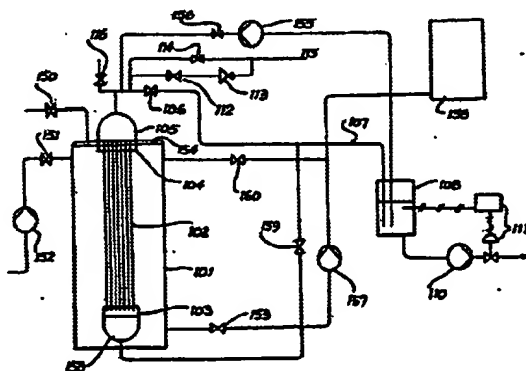
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(34) Title: CONCENTRATION OF SOLIDS IN A SUSPENSION USING HOLLOW FIBRE MEMBRANES



(57) Abstract

A microporous filter assembly is disclosed which, in some modes of operation, has feed pressure fed to the external walls of the microporous fibres (13) comprising the filter. In other forms feed is caused to move across the walls of the fibres (13) by the application of a lowered pressure to the lumens of the fibres (13). Various forms of backwashing of the fibres (13) are disclosed, with none of the modes requiring a prepressurisation step of the environment within and around the fibres (13) prior to commencement of backwash. In particular forms of backwash, initial steps of the backwash include terminating supply of feed to the exterior surface of the fibres (13) and substantially removing remaining filtrate from the lumens of the fibres (13). In some embodiments the filter comprises a filter cartridge (10) including a bundle of fibres (13) housed within a closed, pressurisable shell (12). In other embodiments the filter comprises one or more bundles of fibres (102) suspended within an open vessel (101). The invention reduces the number of required pressurisation cycles of the environment within and around the fibres (13). In some forms such pressurisation is eliminated.

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CONCENTRATION OF SOLIDS IN A SUSPENSION USING
HOLLOW FIBRE MEMBRANES

FIELD OF THE INVENTION

The present invention relates to concentration of solids in a suspension using a hollow fibre membrane and, in particular forms, to methods and apparatus for periodically cleaning by backwashing the hollow fibre membranes.

BACKGROUND ART

Prior art methods of concentrating solids in a liquid suspension are described in Australian patent specifications 576,424 and 582,968. The text and drawings of these specifications are incorporated herein by cross-reference. In that prior art, concentration is effected by a filter element that comprises a bundle of hollow, porous, polymeric fibres in a closed cartridge or shell. Polyurethane potting compound is used to hold the respective ends of the fibres in place within the cartridge without blocking the fibre lumens and to close off each end of the cartridge.

The transmembrane pressure differential necessary to effect concentration of the solids in the prior art is achieved by pressurising the feedstock which necessitates the use of pumps, other ancillary equipment and, of course, a closed filter cartridge.

Backwashing of such prior art concentrators involves increasing the pressure on both sides of the hollow fibres within the closed shell to a relatively high value before suddenly releasing that pressure on the shell side of the

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